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Palumbo, Janice

From:	Heidi Blischke <HBlischke@gsiws.com>
Sent:	Wednesday, August 05, 2015 12:27 PM
To:	Palumbo, Janice; Fuentes, Rene
Cc:	Georgia Baxter; Steven Kuhlmeier; Randy Pratt
Subject:	Arlington, Washington JH Baxter Recirculation Trench Field Effort Summary
Attachments:	removed.txt

Hi Jan and Rene,

The field work to rehabilitate the recirculation trench and install the iSOCs in Arlington went well and is summarized below.

Between July 28th, 2015 and August 1st, 2015 GSI Water Solutions (GSI), on behalf of J.H. Baxter Inc. (Baxter), implemented the EPA approved *Installation of Oxygen Infusers and Rehabilitation of Recirculation Trench Final Workplan* (dated June, 2015). The workplan incorporates the installation of 10 geotechnical borings within an existing groundwater recirculation trench as part of an effort to improve the performance of the site's ongoing Remedial Action Pilot Study. The workplan also outlines the retrofitting of three existing monitoring wells to be utilized as in-situ submerged oxygen curtain (iSOC) infusion wells. What follows is a summary of work activities conducted and observations made during the field effort. More detailed descriptions, logs, etc. will be provided in the semi-annual report.

Work Summary

Trench Rehabilitation

Between July 29th and July 30th, 2015 GSI oversaw the installation of the 10 geotechnical borings within the recirculation trench. The borings were installed using rotosonic drill rig (Figure 1) provided and operated by Cascade Drilling. The locations of the borings within the trench were determined in relation to existing standpipe monuments and system as-built drawings. In general, the borings were installed to a depth of approximately 20 feet below ground surface (bgs) and were backfilled with 1-3" crushed concrete or ½-1½" limestone/basalt rock. Boring locations and respective boring depths will be provided as part of the forthcoming semiannual monitoring report.

Existing trench conditions and boring observations:

- The trench is situated within a primary access roadway for Stella Jones' plant operations. As such frequent heavy equipment traffic and dust suppression activities occur atop the trench. The surface above trench is currently used as a surface drainage pathway (Figure 2) where minor water ponding was present at time of visit.
- Extracted soil cutting from the trench displayed sands and fines present within trench fill material. Fines appeared to be concentrated at the bottom of the infiltration trench's fil material (1-2" gravel) at the interface of native material and the trench (Figures 3 and 4). We suspect that it was this silt at the interface that prevented/reduced infiltration.
- The gravel fill found within the trench appears to contain only a percentage of limestone rock, with the remaining fraction consisting of a basalt gravel (Figure 5).
- Stratigraphy of the soil beneath the trench could be generally characterized as being a fine, poorly graded sand with gravels and large cobbles from 7 to 18 ft bgs. Gravel and cobble fractions reduce with

depth with fine sands and non-plastic silts found around 19 to 20 ft bgs and extending to 25 ft bgs in one boring.

- No apparent biofouling was seen within the trench or native material, as initially thought. Therefore, as mentioned above, it appears that the silt at the interface between the native material and the trench was preventing or reducing the ability of recirculated water to infiltrate.
- Soil cutting from each boring were drummed (55-gal) and stored adjacent the Baxter equipment shed. Soils did not show visual contamination nor was an odor detected in any of the borings.

System Restart

- Following the completion of the boring installation; for the start-up phase, groundwater extraction wells EW-1, EW-2, EW-4, and EW-5 were returned to operation on July 31, 2015.
- To test the new trench capacity EW-1, EW-2, and EW-4 valves were opened to full flow with respective discharges of 13gpm, 12 gpm, and 22gpm. EW-5's operation was not altered and was flowing at approximately 5 gpm.
- A total flow rate of approximately 50 gpm was run through the system for about 32 hours, totaling approximately 100,000 gals of throughput. Throughout the test, intermittent water level measurements were taken from the level switch standpipe in the trench and no apparent rise in water level was detected.
- Before leaving the Site, the total flow rate was reduced to 20 gpm which based on the contour maps and analytical data trends from when the trench was properly operating, is a good flowrate to start out the system. A site visit will be conducted in a month to check the system and adjust flow rates.

iSOC Installation

On August 1st, 2015 GSI installed three iSOC infusion units within monitoring wells MW-39, MW-40, and MW-41. The vaults (Figure 6) for these wells were replaced using vacuum truck provided and operated by Cascade Drilling, iSOC units and related materials were provided by GSI.

iSOC installation details:

- iSOC units were deployed to near the bottom of each respective well (approximately 75-78 ft bgs) and were connected to individual oxygen tanks stored within each well vault (Figure 7). The oxygen tanks were procured from a local Airgas distributor.
- The compressed oxygen tanks contain approximately 60 cf of oxygen apiece and are expect to sustain operation of each unit for 45 days.
- The well vaults are flushed mounted, traffic rated, and secured with a lock (Figure 8).

Photographs:

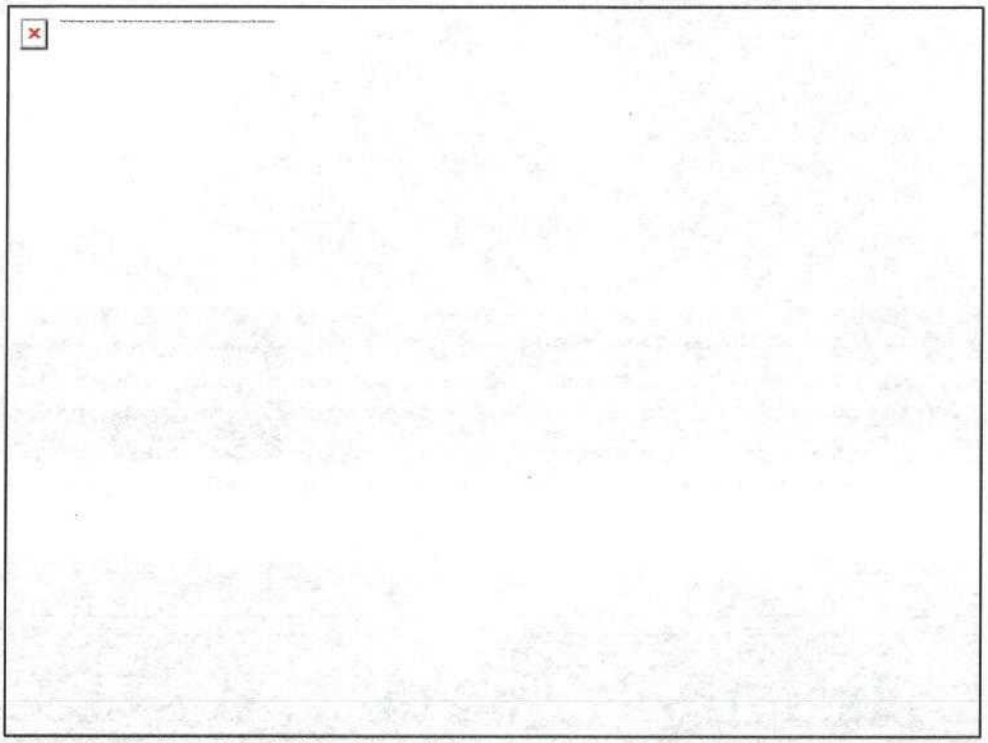

Figure 1. Sonic rig (Cascade Drilling) installing geotechnical boring within recirculation trench.

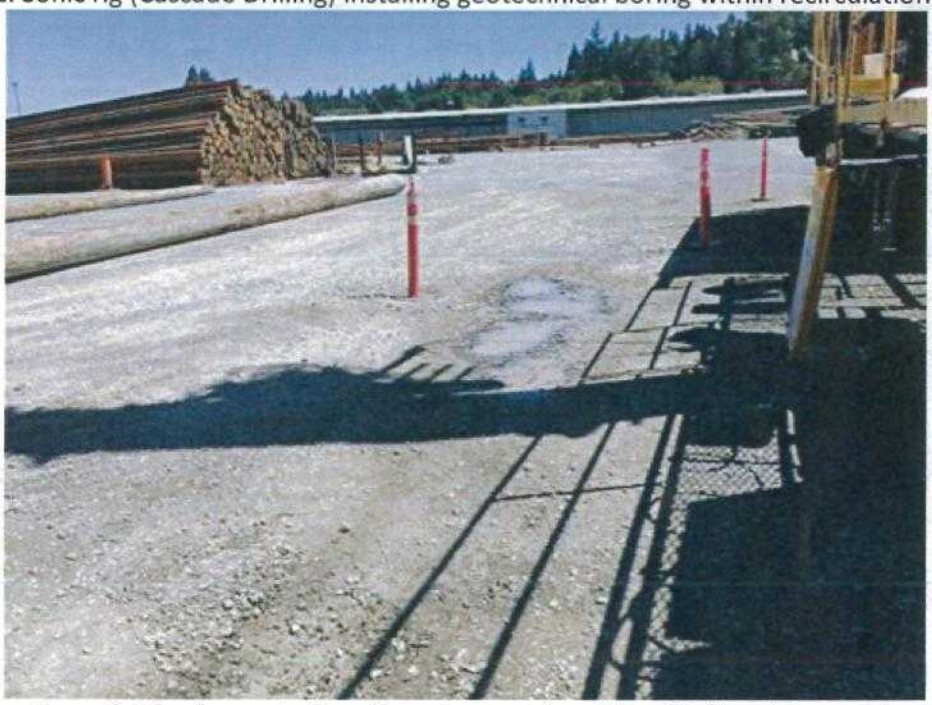

Figure 2. Viewing east of grading atop east/west leg of infiltration trench.

Figure 3. Soil cutting at approximately 6-7 ft bgs, apparent interface of bottom of trench and native soil.

Figure 4. Soil cutting at approximately 6.5 ft bgs, apparent interface of bottom of trench and native soil.

Figure 5. Washed infiltration trench fill rock, 1/2" to 2" sizing.

Figure 6. Well vault installation for iSOC deployment (Cascade Drilling).

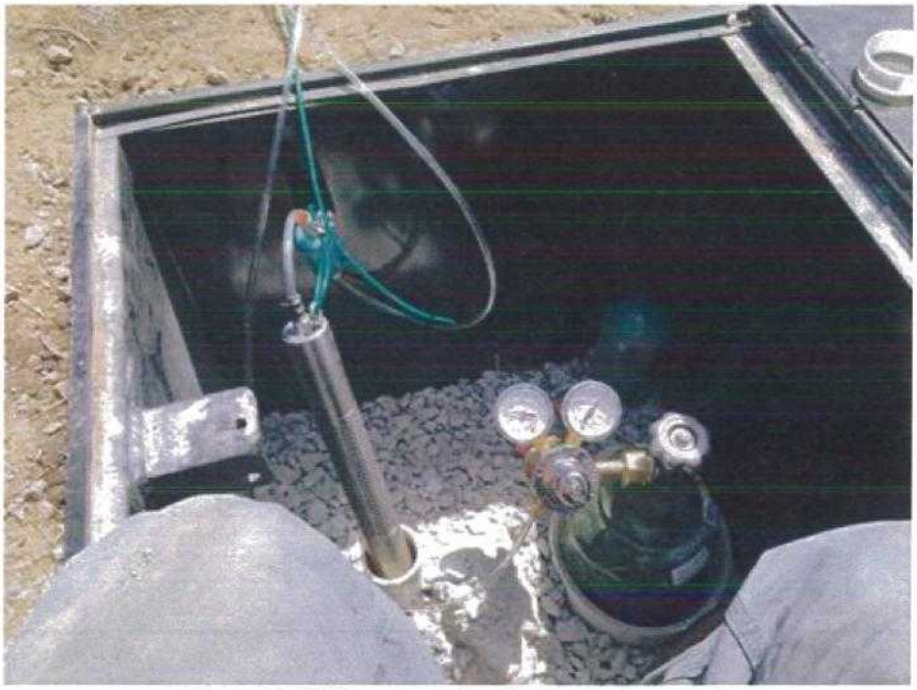

Figure 7. iSOC well vault prior to deployment.

Figure 8. iSOC well vault finished (MW-41).

Please call me if you have any questions. I have moved to Teton Valley, Idaho, but my contact information remains the same.

Heidi Blischke, RG, LHG

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